

TF-SEM II (Rev) Comp. 28/5/13
S.P. & C.C. May 2013

125 : 1ST HALF-13 (r)-JP

Con. 9175-13.

GS-1078

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions out of remaining **six** questions.

(3) Assume **suitable** data if **necessary** and justify the **same**.

(4) **Figures to right** indicate **full marks**.

1. (a) Differentiate between Application program and system program. 5

Indicate the order in which following system programs are used, from developing program upto its execution.

Assemblers, loaders, linker, macroprocessor, compiler, editor.

(b) Eliminate left recursion present in following grammar (Remove Direct and Indirect recursion both) 5

$S \longrightarrow Aa \mid b$

$A \longrightarrow Ac \mid Sd \mid \epsilon$

(c) What is activation record ? Draw the diagram of General Activation record and explain the purpose of different fields of an activation record. 5

(d) What are the different functions of loader explain in brief. 5

2. (a) With reference to assembler explain the following tables with suitable examples : 10

(i) POT

(ii) MOT

(iii) ST

(iv) LT

(b) Let L be the language consisting of strings of a's and b's having same number of a's and b's :

(i) Construct LL (1) grammar for L 4

(ii) Construct a predictive parsing table for the grammar obtained in (i). 6

3. (a) Explain different pseudo-ops used for conditional macro expansion, along with example. 10

(b) What are the different phases of compiler ? Illustrate compiler's internal presentation of source program for following statement after each phase 10

position = initial + rate * 60

4. (a) Explain working of a direct linking loader with a proper example. Clearly show the entries in different databases built by the direct linking loader. 10

(b) Generate three address code for given expression 10

while (a < b) do

if (c < d) then

x = y + z

else

x = y - z

[TURN OVER

Con. 9175-GS-1078-13.**2**

5. (a) For the given grammar below, construct operator precedence relations matrix, 10
assuming *, + are binary operators and id as terminal symbol and E as non terminal
symbol.

$$E \longrightarrow E + E$$

$$E \longrightarrow E * E$$

$$E \longrightarrow id$$

Apply operator precedence parsing algorithm to obtain skeletal syntax tree for the
statement

$$id + id * id$$

- (b) Explain role of code optimization in compiler designing with suitable example. 10
6. (a) For regular expression $(a | b)^* abb$ construct NFA and construct it into DFA. 10
(b) With reference to stack allocation and heap allocation explain runtime storage organization. 10
7. (a) Write a note on JAVA compiler environment. 5
(b) Explain synthesized and Inherited attributes used in syntax directed definitions. 5
(c) Explain DAG. 5
(d) Find first and follow set for given grammar below : 5

$$E \longrightarrow TE'$$

$$E' \longrightarrow + TE' \mid \epsilon$$

$$T \longrightarrow FT'$$

$$T' \longrightarrow * FT' \mid \epsilon$$

$$F \longrightarrow (E)$$

$$F \longrightarrow id$$